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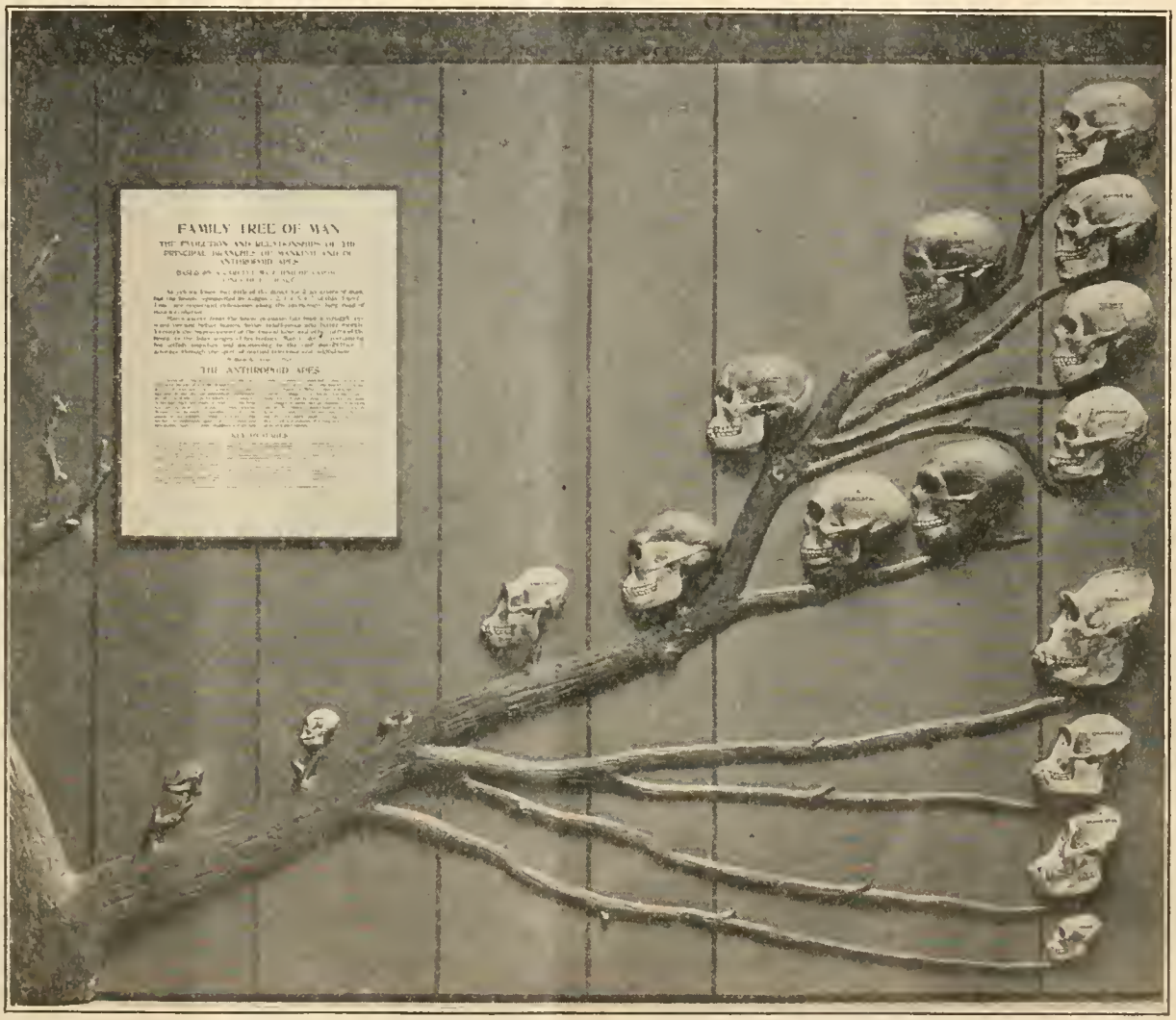


Courtesy of American Museum of Natural History

1. Primitive Primate
2. Prototypal Anthropoid
3. Primitive Anthropoid
4. Trinil Man
5. Piltdown Man
6. Heidelberg Man
7. Neanderthal Man
8. Cro-Magnon Man
9. Australian Blackfellow
10. Hottentot
11. Chinese
12. American

A. Gorilla, Africa
B. Chimpanzee, Africa
C. Orang-utang, Borneo
D. Gibbon, India

FAMILY TREE OF MAN

By Wm. K. Gregory

The Maze of Species

By HENSHAW WARD

THERE is one simple reason why a non-scientist may find it hard to believe the evolution theory: he knows nothing about the infinite number of variations within the species of plants and animals. He supposes that a "species" of animal is a fixed, clean-cut department of life which can always be identified; he supposes that the difference between an animal and a plant is a definite and impassable barrier; he supposes that a "species" of plant is a peculiar sort of organism which a botanist can always recognize.

But the truth is just the opposite: it is difficult to draw a dividing line between plants and animals; most species have variant forms that link them with other species; within every widely-distributed species there are endless variations. The biologist has to believe in evolution because he finds that every flourishing family of organisms is a maze of interlaced forms which would be a disorderly nightmare if it were not for an evolution theory.

I will present some illustrations from botany.*

How many kinds of mosses have you ever heard of? If we had never seen but ten kinds, we could rest with the supposition that they were originally created so; but when we learn that there are sixteen thousand species of these inconspicuous growths and that the more common of the species have varieties that grade off insensibly into varieties of other species, then we can not be content with any such guess at the cause. The more a botanist becomes familiar with the countless varieties of plants, the more certain he feels that he is dealing with some sort of continuous growth of the whole system of organisms. A few dozen different ferns would never have excited a Wallace or a Darwin to cudgel his brains for an interpretation of nature: but the four thousand five hundred species that botanists now know might well cause an inquisitive mind to lie awake at night.

There are about one hundred thousand species of this lower division of plants. Of the higher division, the flowering plants, there are more than one hundred and thirty thousand species. Some of the items that make up the total are five thousand grasses, one thousand palms, two thousand lillies, seven thousand orchids, one thousand two hundred cactuses.

More significant than mere numbers is the way in which plants unlike in appearance are found to be alike in their anatomy and way of growing, so that kinds which are very dissimilar in all outward appearance are found to have inwardly a decided family resemblance. Thus elm trees, fig trees, nettles and hops are found to have such similarity in their flowers that they belong together. The figs include such apparently unlike plants as the rubber tree, the banyan and a vine-like parasite. In another great group the botanists have been obliged to lump together geraniums, flax, oranges, mahogany and castor beans, because they are similar in their ways of propagating. The scientists have no desire to do queer things; they would much prefer to say that rubber trees and milk-weeds are alike because of their milky sap; simplicity has always been their aim. But nature has made it impossible for them to find any simple way of classifying. It is as if she had strung the most diverse forms on one thread of structure, and had then so looped and tangled the thread that the botanists are taxed to their wits' ends to straighten it out in anything like orderly sequence. When a man has labored for thirty years at this effort to untangle related forms, he comes to think of plant life as a labyrinth, and he demands a clue. What will guide him? His work would be easier if he could discover that all the crisscrossing forms were originally created as distinct kinds of organisms, but the opposite conviction is continually thrust upon him—namely, that all plant life has forever been altering in character, putting out changes here, there and everywhere.

The puzzle would not amount to much if a species were always a species—if, for example, a certain kind of pine tree were everywhere the same. But within any species there may be endless variations, some of them amounting to striking differences.

An illustration is a certain small grass growing commonly in the United States and Europe, *Draba verna*. When samples of this are gathered from different parts of the world, it is found that there are many distinct types—no less than two hundred have been counted, each of which will breed true from seed. Each of these types, the so-called "varieties", might be called a species. Any naturalist who cares to cultivate the varieties can breed new ones; he can, as it were, watch the plant branching out into new forms. A botanist in Amsterdam once counted seven hundred varieties of hyacinths. It is estimated that American florists have caused fifty species of irises to branch out into one thousand five hundred distinct varieties, that they have developed as many forms of roses, and that there have been produced in the gardens of the world no less than eight thousand varieties of roses. The great Dutch botanist De Vries says of hawkweed:

"Thousands of forms may be cultivated side by side in botanical gardens, exhibiting undoubted differentiating features, and reproducing themselves truly by seed."

What shall a naturalist conclude after he has spent studious decades in watching these ceaseless fluctuations of countless forms of plant life? What shall he think when he takes stock of this medley of life, this unmapped chaos of contradictions and relationships? He has no chart or compass until he adopts the evolution theory; with it he can always steer a course.

* Taken from *Evolution for John Doe*, Pages 24-26.

The earth has her boundaries, but human stupidity has no limits.—*Gustave Flaubert.*

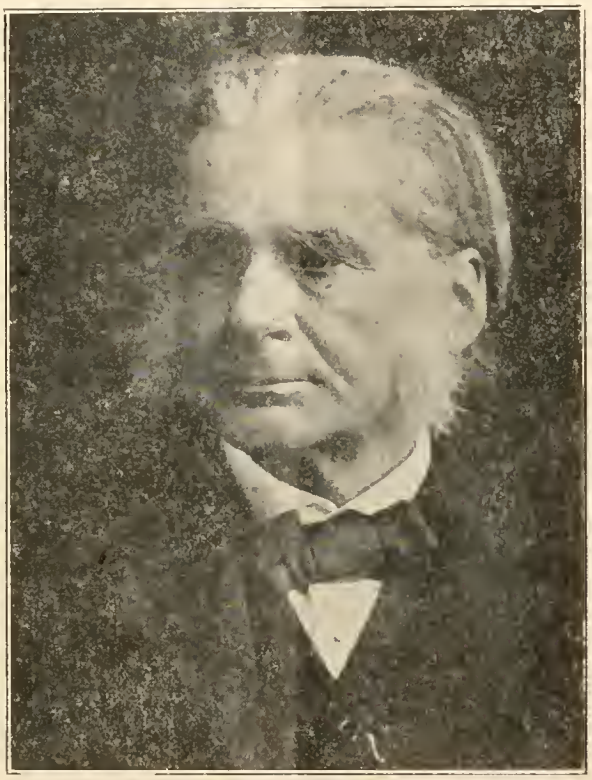
Logical consequences are the scare-crows of fools and the beacons of wise men.—*Thos. Huxley.*

Thomas H. Huxley and Peter Kropotkin

By Alexander Goldenweiser

THE advent of evolution was like the explosion of a bombshell in a hostile camp. The adherents of the doctrine of the immutability of species, the representatives of orthodox theology, all those—among scientists, laymen and clergy alike—who had vested interests in these doctrines, were up in arms. Once more dogma and complacency were shaken unto their very foundations.

In an emergency such as this courage, energy and enthusiasm were needed to take up the cudgels for the new doctrine. These qualities were possessed to a remarkable degree by Thomas H. Huxley, eminent biologist in his own right, friend of Charles Darwin and Herbert Spencer. He took up the fight where Darwin had left it. Eminent divines and silver tongued prime ministers like Gladstone presently found their biblical quotations and oratorical firebrands countered by uncompromising facts from the biological laboratory buttressed by logical rigor. Huxley was a fighter. What Darwin had done in his *Descent of Man* with caution and timidity, Huxley did in his *Man's Place in Nature*, an outspoken and merciless pamphlet, in which he brought together the evidence of comparative anatomy, embryology and physiology, to the effect that man was but the last link in the animal chain, that the differences between man and the anthropoid apes—the gorilla, chimpanzee, orang-utang and gibbon—were slighter than those separating the anthropoids from the monkeys. There was no gainsaying these carefully marshalled facts. In his Darwinian essays, given as lectures to groups of workingmen, Huxley was spreading the new doctrine among the wider groups of the semi-educated.



Thomas H. Huxley

At the fighting front caution is thrown aside and limiting "buts" and "ifs" are easily forgotten. This happened in the case of evolution. The doctrine of natural selection as sponsored by Huxley, assumed the character of a struggle to the death in nature, a struggle of tooth and claw, in which the weaker perished and the victors survived over the dismembered bodies of their victims. Darwin had never intended to emphasize the struggle element to such an extent, especially not the feature of its ferocity. But the picture drawn by Huxley had dramatic appeal and it was taken up by less scrupulous popularizers who distorted it still further. From that time on the biologically inspired doctrine of struggle, in which the weak perished and power conquered, exercised a sinister influence on sociological and political thought—as, for example, in the doctrines of Gumplowics and his disciple Ratzenhofer, the Austrian sociologists. The struggle of men and nations for survival, for conquest, was but a sequel of that vaster struggle always carried on in nature in the form of natural selection.

This exaggeration of the Darwinian theory was countered by Peter Kropotkin, anarchist, geologist and amateur biologist, in his fascinating book *Mutual Aid in Evolution*. In the pages of this remarkably detailed and erudite study, Kropotkin pointed out that the other factor in biological progress, a factor lost sight of in the Darwin-Huxley theory, was co-operation, mutual aid. Through co-operation weaker animals such as wild horses, asses and goats, managed to survive and multiply in the face of the depredations of their more powerful preying foes. Kropotkin also made the important point that the "struggle" was not so much between species and species, as it was of animals against nature, physical environment, climate, and that it was in this latter kind of struggle that the fitter survived. Not satisfied with having demonstrated the importance of mutual aid in the animal kingdom, Kropotkin carried his researches further into the field of primitive society and thence to the cities of medieval Europe and modern workers' co-operatives. Kropotkin's well documented and brilliant book serves as a necessary counter-poise to the one sided distortions of the original Darwinian doctrine.

"The only question which any wise man can ask himself, and which any honest man will ask himself, is whether a doctrine is true or false."—Thomas Huxley.

* * *

"Whatever happens, science may bide her time in patience and in confidence."—Thomas Huxley.

"Thoughtful men, once escaped from the blinding influences of traditional prejudice, will find in the lowly stock whence Man has sprung the best evidence of the splendor of his capacities; and will discern in his long progress through the Past a reasonable ground of faith in his attainment of a nobler Future."—Thomas Huxley.

How Man Differs From The Ape

By Bernhard J. Stern

II. PSYCHOLOGICALLY

"ARE apes and monkeys our poor relatives?" asked Doctor R. R. Marett, the English anthropologist in a recent lecture. His answer: "I think myself that it would be snobbery to deny it."

It has been a common feature of such snobbery to glorify man and his abilities and achievements at the expense of the anthropoids. Various *unique* abilities and powers have been attributed to man that are also present among our poor relatives. And when one reads Koehler's *The Mentality of Apes* and Yerke's *Almost Human* one comes to the conclusion that these relatives are not as poor as we have thought them to be.

For example one hears repeatedly that "man is the only tool-using animal". Anyone that knows anything at all about the behavior of the apes will deny this. Put some bananas beyond the reach of a chimpanzee and have a stick in the vincinity and you will observe how quickly the bananas will disappear in the stomach of the animal. The ape will use a box, a pole, even the back of a man to get some coveted bananas that are too high for him to reach. He also uses straws and twigs for spoons and for catching ants.

"But," says the reader who has been raised in the conceit that he alone can use tools, "Is not man the only tool *making* animal?" Not even that is man's *unique* ability. Koehler indicates effectively how the ape too creates tools. The outstanding instance is that when an ape broke off a branch of a bush and used it to obtain his food. No more can we use that dramatic but hackneyed opening sentence of the legend of man "That moment when our primitive forefather broke a branch from a tree and made it into a club he became human."

There are wide psychological implications in the manufacture of the tool described above. It dispels another of the *unique* powers attributed to man—that of abstract thinking. For to perceive the possibilities of a stick in a bush is to distinguish between a part and a whole which is an advanced type of abstract thought. And of course, the use of tools of any sort implies purposeful thinking. that is, directing behavior for a certain end.

Memory is another of man's supposed attributes which the ape is thought not to possess. But this too is incorrect. Careful observation and experiment has proven that the ape does remember and even associates unconnected objects, as for example where a stick was put twelve hours previously in order that he might get some bananas outside his reach that are particularly tempting to him at the moment.

The greatest and most popular conceit of man in regard to the apes is man's idea that the ape *apes* him. Apes do *not* ape anything they do not understand or comprehend. When a man makes a fool of himself before the ape's cage at the zoo, he is deceiving himself if he thinks that the ape is performing any antics that he would not do were the man not there. The acts which were thought to be an imitation of man are performed by apes who have never encountered a Homo Sap.

What then is the distinguishing feature between man and the ape? It is the fact that man has an articulate language. The ape has this only in a very rudimentary form. Learned recognized thirty-two sounds or elements of speech relating to food, drink, to other animals and persons. But man's well developed articulate language which is itself a learned trait, has enabled him to transmit and accumulate knowledge from generation to generation. Through it he has been able to build a culture which has enabled him to transform his environment and which in turn transforms him.

"Is This Me?"

By George A. Dorsey

SEX is biologic; it has a natural history—like the bones of our body, or the cells of our brain. Civilization is quite another affair—human history writ large. Man can mould, change, alter, destroy civilization, but sex and human nature are in the blood, part of our natural inheritance. To understand ourselves and our civilization, we must know that civilization has come to be what it is because we are what we are. What are we?

Man is not what he thought he was. His own dogs bark at him. Like the old woman who woke up in the market-place and found her petticoat cut off to her knees, he asks: Is this me, or isn't it? And if not, who am I?

Men and women make Man. The Psalmist exclaimed in awe: "Lord, what is Man?" "Lord, what is Man not?" asks Hewlett scornfully. Neither attitude gets us anywhere. Nor did our calm complacency of a few years ago. We even boasted of our power over Nature. We did not know that it was loaded. That "power" burst—filling our body with shrapnel, befogging our mind with the fumes of poison gas.

Reaction: nations demand new bombers; Man, new remedies—the old ones have lost their kick. Both demands are met: new explosives, new prescriptions. Some would prescribe for human nature as if it were a disease, to be cured in six weeks with six bottles, or with a new set of glands!

Is that it? Is it Man's nature that is ailing? But to cure it—six weeks? In 60,000 years, possibly. If the past is any guide, Man can no more "cure" his nature than he can pull himself up by his bootstraps.

Perhaps Nature will cure him. Perhaps. But not soon—Nature takes her time. She allowed the Elephant

two million years to lose one tusk, the Horse a million years to lose one toe. She gave Man five million years to lose his tail; we carry around five bones of it yet. A half-million years ago she stood Man on two feet; our bodies are not yet adjusted to an upright gait.

It is curious that Man trusts his voice to the telephone and his family to the motor car, while he still clings, like the poet's vine to the mouldering wall, to his ancient notions about his own nature. It was more than 200 years after Man knew that the earth revolves once every twenty-four hours, that he discovered his own blood completes its circuit every twenty-three seconds. He can predict comets, but not wars, famines, or elections. He knows his Ford's viscera better than he knows his own. He rears calves more intelligently than he raises children. He does not know why he suffers from rupture or drops dead of heart-failure; or that he has hare-lip because there were Sharks in his ancestry, and cleft palate because he is of the line of Amphibia and Reptiles.

East is East and West is Europe, said Kipling, thereby insinuating grave error. But had he said that Susie O'Grady and the Chinese lady are sisters under the skin, he would have served truth. What we should like to know is: why is their skin different? Or why an East, or a Chinese lady—or women at all? And if Man's nature is incurable, are his habits? Or is Man the only dog that cannot learn new tricks, the only machine that defies law, the only animal that cannot be understood?

What are we? Before we can answer that question we must know something of our physical body: what it is, where it comes from, who made it, what it is good for, what is its upkeep. Why so many sizes and colors; will the color fade; is one color, size, or sex better than another? Why do so many fail before they are used up, why do they wear out at all? Is it coming or going, is there likely to be a new model out soon, and will it be better (and if so, in what respect), or cheaper?

When we know this body of ours we begin to know what we are—and that will help us to understand why Man made culture and why we call our culture Civilization and think it pretty good. It will also help us to understand why the old lady who lost her petticoat in the market-place got frightened when she discovered she had legs—and why her dog barked at her.

X-Rays Stimulate Variation

Below we reprint from "Science" of January 27th, 1928, an abstract of the paper by Dr. H. J. Muller of the University of Texas presented before the Joint Genetic Sections of the American Society of Zoologists and the Botanical Society of America, at their Nashville meeting. Awarded the American Association Prize of one thousand dollars for the most notable contribution to the advancement of Science. We hope to have a less technical presentation of this tremendously important subject soon.

"The Effects of X-Radiation on Genes and Chromosomes" (*Abstract*)

THIS paper reported the author's experiments of the past fifteen months on the hereditary effects of X-rays applied to the fruit fly, *Drosophila melanogaster*. By means of special courses, the discrimination of mutations in individual genes from genetic recombinations of various sorts (due to segregation, non-disjunction, etc.), was facilitated, and lethal as well as visible changes were rendered detectable. Results in the second and later generations, based on several thousand cultures, showed that gene mutations had occurred in the most heavily treated germ cells at about 150 times the frequency of those in the controls, derived from the same source, while in germ cells less heavily treated the result was intermediate. Germ cells in all stages studied were susceptible to the effect: these included oögonia, ova, spermatozoa shortly before fertilization, and spermatozoa when rayed either in the male or in the female receptacles six or more days prior to fertilization.

The induced mutations resembled spontaneous ones, inasmuch as: (1) The great majority were lethal; of the rest most, but not all, reduced viability or fertility. (2) Recessives greatly outnumbered definite dominants. (3) Many of the visible effects were relatively inconspicuous. (4) Though "new" mutations were somewhat more frequent, there were also numerous repetitions of familiar mutations. (5) All regions of the chromatin were affected, but the induced mutations were more densely distributed in those regions of the linkage map in which more spontaneous mutations have occurred. (6) Multiple allelomorphism occurred. (7) So also did reverse mutation of genes already mutant when treated. The two latter facts argue against the effects always being complete losses or inactivations. (8) Though point-mutations were the rule, there was an occasional "line-mutation" involving a row of neighboring genes, as if by an electron that had passed parallel to the chromonema. (9) The vast majority of the treated genes, both mutant and normal-seeming, remained stable in their inheritance throughout succeeding generations, though at least one case of an "eversporting" condition arose.

Evidence was secured (by making use of non-disjunction) that only one of the two identical genes, or allelomorphs, present in a diploid cell, is caused to mutate at a time. The effect on a given gene, in a haploid germ cell, is "fractional," in that only a fraction of the resulting embryo will receive mutant gene material, the remainder being of normal gene content. Since there is no evidence of an indiscriminate intermingling of the mutant and normal tissues thereby arising, it becomes unlikely that the gene is compounded of many interchangeable members. This is also evidenced by the stability of treated genes in heredity.

Besides gene mutations, frequent rearrangements of gene order—involving inversions, translocations, duplications, etc., of chromosome sections—were found, by genetic evidence, to be produced by X-rays. These provided information concerning various questions. For example, cytological verification of two such cases yielded direct evidence for the physical validity of the linkage maps and of the corollary theory of crossing-over.

Spheric Mirror Shows Human-Ape Relationship

By A. L. HERRERA

Fig 1

THE study of the distortion of natural objects as reflected by a spheric mirror is instructive. It exaggerates details of structure and form in such a way that insignificant differences are remarkably accentuated, and discovers the reciprocal relations of organic forms, their common and differential characters. It confirms many of the presumptions of the theory of evolution and discloses some important facts of morphogeny. In some cases it even allows us to foresee the results of artificial selection and cross-breeding.

In a spheric mirror, the nearer the object is, the bigger is the image. The size of whatever is farther away from the mirror is aparently reduced. Thus a kangaroo may acquire the normal aspect of a mammal having four legs of the same size. If its head and fore-limbs point toward the mirror its long hind-legs are apparently shortened. And thus the size of an ibis' beak whose base is held toward a curved mirror diminishes so that it assumes the shape of the normal bill of a small bird.

It is a plain and practical manner of demonstrating the old law of Geoffrey de St. Hilaire, or organic compensation.

As shown in the drawings (Figure 1) the orang-outang's skull (a) reflected in a spheric mirror (a glass of liquid air), with its maxillar region as far as possible from the reflecting surface, assumes (b) the aspect of a brachicephal human skull. The maxillar region could not be shown satisfactorily in the drawing, but any one can try the experiment and see that the maxillary and dental prognatism disappears completely.

Figure (d) shows a normal human skull placed before the mirror so that the facial and maxillar regions may appear larger. The result (c) is worth notice. It becomes the image of an ape's skull. Compare it with (e), the Gorilla skull. Note its big oblique orbits, very narrow forehead, well marked maxillar and dental prognatism, and bent back chin. It looks very much like the skulls of fossil men; its general aspect is beastly and very far from human.

We can see here how the development of the occipital part and of the vault of the cranium in human skulls reduces, by organic compensation, the facial and maxillar parts. This even indicates that supermen will have an enormous cranial vault and atrophied maxillaries.

Fig 2.

The second figure is a chimpanzee's head modelled in wax. It seems human as reflected by the mirror. (Figure 2).

This demonstrates that the gap between man and ape is small, and that a mere compensation of growth in certain directions is sufficient to bridge it.

Evolution and the New Perspective of Life Purposes

By Harry Elmer Barnes

THE evolutionary conception and the new cosmology are as disruptive of the accepted views of man as they are of the older theological attitude towards God. According to the accepted biblical theory, man was a theological entity and not a unit of bio-chemical behavior. He was important chiefly as the custodian of an immortal soul, for which his fleshly being served merely as the temporary envelope pending the earthly experiment which determined the destiny of each individual soul. In the more optimistic passages of Holy Writ man was defined as only a little lower than the angels, while in the more abject strains he was viewed as but a worm of the dust.

The scientific facts reveal man as neither a worm nor an angel with pruned wings. He is the leading member of the simian group and therefore the dominant element for the time being in the animal kingdom. This view of man as an animal has been extremely repellant to many of the more pious and conventional brethren, but there is little rational ground for such an attitude, once it is understood what one really means by this. When one views the situation in a scientific and common sense attitude, he recognizes that the animal kingdom represents the highest order of life on the planet; that is, the highest level of development known to man. Therefore, to be the temporary leader of the animal world is the highest form of achievement to which man could possibly pretend and this title is the superlative praise which can possibly be bestowed upon him.

Harry Elmer Barnes

Further, not only is the conception that man is an animal a demonstrated fact in no way humiliating to the human race; it also has much more practical significance. If it were known to be true that we are slightly mitigated angels, this would afford no clue to the study of mankind, because no one has seen an angel and we possess no knowledge of the personal traits and behavior patterns of the angelic host. On the other hand, once we come to recognize the fact that man is an animal we immediately have the rich field of comparative anatomy, physiology and psychology to draw upon and from which to build a solid approach to the study of human nature and behavior. These branches of science reveal man as a super-simian, and the study of simian psychology, as summarized in such books as those by Kohts, Koehler and Yerkes, affords more in the way of a key to human behavior than all the books on theology ever compiled from the days of primitive folklore to the most abstruse apologetic manual of a contemporary professor of systematic theology. Even a humorous and avowedly trivial little book like Clarence Day's "This Simian World" will tell one more relevant and cogent things about human nature than all the ponderous tomes of an Aquinas or the collected sermons of a dozen Moodys or Spurgeons.

The implications of the above for sociology and ethics are very great and far-reaching indeed. It comes down to this, namely, that the type of behavior and institutions which are best suited to advance human happiness and efficiency must be sought and constructed in conformity with the need of a species of super-simians inhabiting diverse types of geographic environment.

The implications of contemporary astro-physical discoveries, together with the parallel progress of research in biology and anthropology, have necessitated a complete revolution in the accepted views of the purpose of life. This earth can no longer be regarded as a temporary training-camp, preparatory for life in the New Jerusalem. rather, it can be rationally regarded at present in no other way than as a place in which a man should make himself as happy as possible during his temporary existence here upon earth. Not only must the objectives of human life be reduced to a secular plane, but we must now definitely enunciate and defend "the right to be happy." To be sure, we may concede at the outset that happiness need not be identified with the tastes and achievements of Casanova, Fatty Arbuckle or the "Old Soak," though they may be as safe and desirable guides as Calvin or Immanuel Kant. We must formulate a conception of happiness which will be sufficiently comprehensive and well-grounded. Perhaps, as a statement of general principles, we can do no better than to revert to the one great previous effort to formulate ethical principles on secular foundations, namely, the ethics of the Greeks, and particularly to Aristotle's conception of virtue as the "happy mean." But we can go further than the Greeks in transforming this generalized formula into terms of concrete guidance through our present day knowledge of biology, psychology and sociology.

"NO MAN ever had eyes less hampered and more assisted by his mind than Alexis De Tocqueville; born in an age which buzzed with theories, he could nevertheless see what he looked at: he believed what he saw in a day when most people only saw what they believed."—From *The Villager.*

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PUSSY-FOOTING

In the report of Austin H. Clark, News Manager of the recent Nashville congress of the American Association for the Advancement of Science we find the following illuminating observation:

"Certain aspects of science in the recent past have given rise in Tennessee to a considerable amount of controversy, and it might have been expected that at this meeting the local papers would seize the opportunity of reviving the discussion. Nothing of the sort occurred. On the contrary, the local papers handled a delicate situation in such a masterly way as to give a new broader meaning to the phrases of southern courtesy and southern hospitality."

A year's free subscription will be given as a prize to any reader proposing a better name for this than "Pussy-footing."

BELOW THE BELT

John Roach Straton, fundamentalist preacher, achieves notoriety no matter where he orates. Just now he is reported to have "struck another vigorous blow at evolution" in San Jose, California.

And of what consisteth this "vigorous blow"? Hath the Reverend Doctor conducted experiments or observations to disprove any one of the myriad items of evidence for evolution accumulated through the painstaking labor of legions of scientists all over the world? Listen to the Great Divine:

"Consider Hickman. What did Hickman study in school? Did he study the Bible? No, he studied evolution."

Of course, if Hickman had studied evolution it would prove exactly nothing at all in this connection. But the fact happens to be that Hickman was very religious, saw the "will of God' in all that he did, and prayed constantly to get out of trouble.

From here it looks like this John Roach follower of the lowly Nazarene is *hitting below the belt.*

CONFIDENTIAL QUESTIONNAIRE

The following questionnaire has been sent to every College and University President with the notation that "answers are for compilation only and will be held in strict confidence. If you wish to comment for publication, please use separate sheet. Kindly return before March 25th, so that we can compile the answers for our April issue."

1. Is evolution taught in your institution?
2. Is it taught as fact, or as mere theory?
3. Do YOU consider evolution a fact?
4. Should teaching evolution be prohibited by law?
5. Shall we send our magazine, EVOLUTION, to your library regularly?

Enough answers have already been received to assure that the compilation will be most interesting and instructive. It will be made a feature in the April number of EVOLUTION and should achieve a wide circulation among students as well as teachers.

JUST A WORD

The printing of a signed article does not necessarily mean its endorsement. The editor does not presume to limit this journal to articles with which he agrees, but also prints others that he thinks would be interesting to the readers.

Our advertising columns are open to organizations and concerns that are "on the square". We shall never knowingly permit any fake or mistepresentation. In this we ask the co-operation of our readers.

EVOLUTION DINNER

The EVOLUTION DINNER will take place at 6:45, Friday, the Thirteenth of April, at Cafe Boulevard, 132 West 41st Street. Mark this in your note book right now if you are within hailing distance from New York. For of course you'll want to be there to get acquainted with the writers and some of the other supporters of EVOLUTION.

There will be a symposium on "The Evolution of EVOLUTION". No long-winded speeches. Limit: five minutes. Some splendid music. Also "eats".

So plan to bring some friends. The rate will be $1.75 per person. Please make reservation as long in advance as possible.

FRIDAY THE THIRTEENTH

Friday the Thirteenth of April is the first anniversary of the chartering of the EVOLUTION PUBLISHING CORPORATION. Will you send a Birthday present to this lively kicking infant in the form of some new subscriptions? And perhaps also a contribution to help broadcast sample copies? We hope to be remembered THIS month by EVERY reader.

IN THE BEGINNING

Two tiny cells unite, surrendering
Their individualities, to bring
A new-born entity to life; and so
The lunar cycles glow and dim and glow;
While Nature, for the millionth time, resolves
The mystery of HOW mankind evolves.

The single cell divides and multiplies,
And passes through a thousand forms, and dies
A thousand deaths of change, and yet survives
Till, at the end of half a million lives,
Nature completes the sum of it, and flings
Her proved solution to the World of Things.

"Here is the heir of all that was", says she,
"And here the sire of all that is to be!"
They cut the cord, draw the placenta through,
And go to tell your father that it's YOU!

—C. H. M.

A DINNER IN YOUR CITY TOO?

Mr. O. O. Whitenack of the Colorado Rationalistic Association writes:

"At the same hour you are feasting in New York and planning to get the scalps of the bigots we are going to have a dinner in Denver in honor of your great magazine and the gospel it proclaims. We hope the same will be possible in other cities Professor Shipley should be able to send his greetings from the Pacific coast and Mr. Steiner should have a meeting in Chicago.

"At about seven oclock that evening (9 p. m. New York time) we want to exchange greetings with you by telegrams, messages that will express to the world what we stand for and what we hope to accomplish.

"Neither of us is to let the other know the message we are to send, but it must of course bear upon evolution and the magazine. We will let you know what details are arranged as soon as possible."

This is truly a splendid idea. Similar dinners might be arranged in every city for FRIDAY THE THIRTEENTH of April, wherever there is an interested group of EVOLUTION readers, to celebrate the birthday anniversary of the EVOLUTION PUBLISHING CORPORATION and make plans for the struggle against fundamentalism in their communities.

Details, such as addresses where dinners are to be held, hour and price, names of responsible persons, speakers, etc., should reach us by March 25th if possible, to be published in EVOLUTION.

Every reader is invited to help make FRIDAY THE THIRTEENTH of April a tremendous nation-wide demonstration in favor of the freedom to learn and teach whatever science discovers.

Write us your plans right away. But do not wait for approval. Follow the splendid example of our friends in Denver and GET BUSY.

What Evolution Means to You

By Maynard Shipley

THE evolution concept is not merely one of the grandest generalizations of science; it is also of real practical significance, not only to the fathers and mothers of the children who must attend our tax-supported schools, but also to every citizen in his own right. It has an important bearing, on every problem that we have to face.

Maynard Shipley

At this point I can imagine some even of the readers of Evolution saying to themselves: "Well, I know that evolution is an important scientific concept, and I believe it should be taught in our schools, but what do I personally care about it? Evolution doesn't butter any bread for me!"

Some months ago, as president of the Science League of America, I received a letter from a very well-known medical man who practises in one of the southern states. As a graduate of one of our great medical colleges, he is, of course, an evolutionist. But he expressed the opinion that it was not necessary that our boys and girls should be taught biology—the science of living beings. He did not claim that biology could be properly taught with evolution left out; he knew, as all real students of science know, that it could not. But he asked if the time devoted to the natural sciences in our schools could not, to better advantage, be given to some useful art or trade.

But why the antithesis? Why not give at least a small part of the time to the science of healthful and enlightened living, along with the art of making that living? Why devote *all* of a pupil's time to business methods or business ethics or to learning a trade—in short, to making money? Is money-making an end in itself? Or is not the making of money merely a means to a higher end—namely, the rounding out of a wholesome, comfortable, helpful, sane, and beautiful life?

Why, indeed, should not all boys and girls be taught at least the elementary principles of biology and geology and astronomy (all of which, I repeat, are dependent on evolution for their proper understanding)? We teach them the best in literature, something of the world they live in and its history, the easier parts of mathematics, a little of art and music, perhaps some foreign language: but too many of us think a boy or girl can be "educated" who knows nothing whatever of the great basic foundation of all modern life—science.

Perhaps few would deny that we owe the best that modern culture affords to "all the children of all the people." Tomorrow they will be voters, who may be called upon to decide whether biology and geology (which necessarily involve the processes of evolution) shall be taught at all in twentieth-century America. Above all, our children must learn that all contemporary investigation is firmly based upon the evolutionary concept, and that this concept touches upon every phase of modern life—even including personal hygiene and public health.

Not only is the evolution concept necessary to a real understanding of the natural sciences, but it is essential in every branch of human welfare—in plant and animal industry, in medicine, surgery, geology, zoology, psychology, human origins, child study, criminology and penology—in short, in every department of human knowledge. The great progress of applied science today in America is entirely dependent for its continued growth on freedom in pure science. If you destroy the root, the tree will fall.

Among the most treasured books in my library is a work by Charles Darwin—a volume which was used for a period of thirty-five years by that greatest of experimental horticulturists, the lamented Luther Burbank. It was because of his close study of the works of the immortal Darwin that he was able to give to the world not only hundreds of new flowering plants of unexcelled beauty, but also new fruits, vegetables, and cereals which have added hundreds of millions of dollars to the value of products of the soil.

It is obviously the duty of all who appreciate the patient and painstaking workers in field and laboratory, to aid in the protection of freedom in research and instruction. It would be humiliating, indeed, to be a citizen of a state or country where science was shackled and despised; but, more important still, it would also be dangerous to public health and welfare.

It has well been said that "if there is any method of insuring that what is taught is true, better than that of giving investigators and teachers the utmost freedom to discover and proclaim the truth as they see it, that method has never been discovered. If those who know most about a subject sometimes decide wrongly, matters are not likely to be mended by putting the decision into the hands of those who know less."

While it is well known that not one living biologist, geologist, botanist, zoologist, palaeontologist, or anthropologist, of recognized standing in his profession, anywhere in the civilized world, doubts that things came to be what they are found to be, by a process of evolution—of orderly change under immutable natural laws—nevertheless, what the friends of science are really supporting (or trying to protect) is not so much this unanimous conclusion of the scientists, as the validity of the method on which it is based, the *method of science*, and the moral right and duty of the workers in field and laboratory to make known to the students in our tax-supported educational institutions the full results of their researches. Science commands our respect, not on the basis that its present conclusions are absolutely and for all time true, but on the ground that its *method* is for all time true—the method, not of tradition or revelation or authority, but of discovery, careful observation, research, experimentation, comparison, testing, analysis, synthesis. We want to know, not what somebody said that someone else said, many centuries ago, perhaps, but, precisely: "What are the present facts in the case?" These facts, as fast as discovered, must be set in order, then interpreted or accounted for; not in accordance with tradition or unsupported logic, but in accordance with all the knowledge at the moment available. Our boys and girls are entitled to the full benefits of this method—the method of science.

We sometimes hear it said, "But scientists change their conclusions; what the pupil learns today may be invalidated tomorrow." To a certain—and a very limited—extent this may be true; in other words, science is not static, but grows as more and more is found out by research. But once the pupil has been thoroughly grounded in the scientific method and attitude, these changes will only add to his knowledge as they are revealed to him. He has hold of the basic principle, and is prepared to receive and understand each new discovery as it is made, and each new conclusion as it is formulated. A generation educated in even the most elementary principles of science would find this world a far more interesting, more healthful, and more reasonable place to live in, than one where the inhabitants had grown up in ignorance of this foundation of all progress.

Evolution is the one and only scientific conception which "serves to give unity and direction to the study of human culture as a whole."

How Old Is the World?

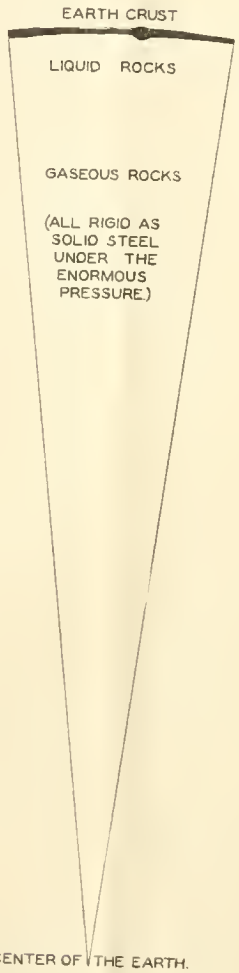
By ALLEN S. BROMS

GOING down a deep well or mine-shaft, one would find the ground temperature rising steadily,—about one degree Fahrenheit for each fifty feet of descent. At this rate, the temperature at twenty miles below the surface would be sufficient to melt some of the rocks. At the center of the Earth everything would be, not merely liquid, but gaseous, though the enormous pressure of the overlying rock matter would keep the whole mass (solids, liquids and gases) as rigid as if made of solid steel. Only a very thin outer crust would be solid because it was cool.

I daresay the Fundamentalists would explain all this as due to "fire and brimstone" and picture (with more or less holy self-satisfaction) that eternal abode for us evolutionists in which we are doubtless to occupy the most scorching place of honor. I fear, however, that we must disappoint by rejecting this pious explanation in favor of one that is sensible.

Earth Heat From Radioactivity

Chemical analysis of various kinds of rocks from all parts of the Earth reveal the fact that practically all contain minute portions of the radioactive elements uranium and thorium. By a series of steps, these elements finally break up into helium and lead, the helium being shot out most violently (see illustration). Heat is thereby released, slowly, but steadily. As we can readily measure how fast heat is given off by each element and we know quite closely the amounts of the elements in the rocks of the Earth it is a simple matter to determine whether enough heat is given off to account for the temperatures found underground, keeping in mind that much earth heat slowly works its way to the earth surface and is then lost by radiation into outer space. We find that not only is enough heat thus produced, but *too much*. This would indicate that the Earth is not cooling off, but actually getting hotter. Thereby, we shall find, hangs a most interesting geological tale.

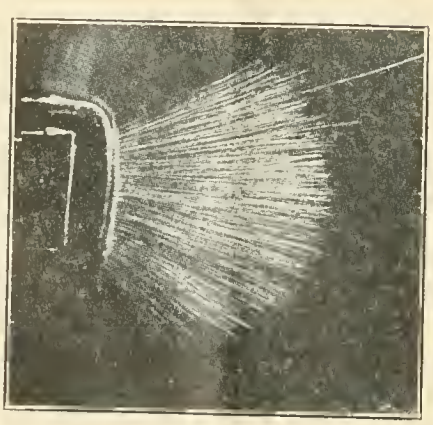


A slice of the earth according to the Radiactivity Theory

Previous Age Estimate Too Low

On the opposite assumption, that the Earth was gradually cooling off from an original molten state, Lord Kelvin had estimated the age of the Earth at 40,000,000 years. All he had to do was to measure the rate at which the earth heat was being radiated into space, make due allowances for higher rates at higher temperatures in the past, and figure how long it would take to cool it from the molten state.

Geologists claimed that his estimate was too low. They had studied the rates at which sediments were being deposited, they knew what miles upon miles of sedimentary rocks had to be accounted for, and they found forty million years too short. They determined the rates at which streams were cutting and lowering continental surfaces and about how much of this had been done in the past, and again the time allowed was too short. They measured the saltness of the oceans (particularly the sodium content) and how fast the rivers and shore waves were removing the salts from the rocks to the seas, and they concluded that the oceans themselves were more than 100,000,000, perhaps even 175,000,000 years old. Of course, this would make the Earth itself much older.



Tracks of Helium Atoms shot out from Thorium

Heat of the Sun Explained

Until the discovery of radioactivity, the heat necessary to keep the Earth warm for such a long time could not be explained. The heat from the Sun, though it makes a lot of difference at the surface of the Earth, does not penetrate very deeply below that surface. Besides, it had been taken into account. In fact, it presented just another difficulty, for from what source was derived the enormous amount of heat being radiated by the Sun? If the Sun were solid coal, it would all be burned out in a few thousand years. A theory of heat from contraction extended the time to a few million years. But the heat from radioactivity multiplied this into billions of years, in closer agreement with what we know of the age of the Earth.

A Peep Into the Geologic Future

In the Earth itself, it was found that the heat from radioactivity more than offsets the loss into space and that the Earth is therefore probably getting hotter. Some of this heat reaches the surface and promptly escapes into space, but the temperature deep down inside is slowly rising, for the earth-crust acts as an excellent blanket in keeping the accruing heat inside. Professor Joly has carefully figured the rate of this heat accumulation and concludes that in some thirty to forty million years the temperature will rise high enough to melt and weaken portions of the earth crust. If this is true, then eventually the lid must blow off.

What happens when the lid blows off is another story, to be told in the next article. Only one effect need be noted here. According to Joly there ensues a period of rapid heat release so that within six to twelve million years quite all the accumulated heat would be lost. Then the earth-crust blanket would settle down again to its job of holding the heat accumulating for the next great cycle. Every forty to fifty million years these great cycles would repeat themselves. And as we have good reasons for believing that five or six of these cycles have occurred in geological times, we can again estimate the age of the Earth,—roughly between two and three hundred million years, which agrees fairly well with the best estimates from other evidences.

Evolution and Evolution Theories

By Walter C. Kraatz

MANY well-intentioned but much mistaken people regard evolution (customarily called the theory of evolution) as merely theoretical and as synonymous with Darwin. Of the many ordinary misconceptions met with by one teaching biology, this one of identifying Darwinism with evolution is one of the most widespread and persistent. Countless times is the mistake corrected in the numerous courses given and in the books on evolution for student and laymen, and still the idea sticks, to the confusion of many, who therefore are in doubt about the solid establishment of evolution itself.

Naturally if one were to approach the subject without biological background and without plan or system read some older evolution books, including the greatest classics of evolution for all time, the works of Darwin, he would quite possibly not differentiate the two things, because he would be going through a lengthy enumeration of facts tending to demonstrate evolution, and at the same time, getting most pointedly the constant explanation of evolution by natural selection as given by Darwin. In the popular mind and also in the careless words of some science writers, evolution is identified with Darwinism. It should not be done, even though Darwin is the greatest figure in evolutionary biology and did more than anyone else to establish evolution, as well as offer about the most acceptable explanation or causal theory that has been offered. Some do not agree to his causal theory of natural selection, but they are nevertheless staunch evolutionists. Evolution should no more be regarded as synonymous with Darwinism than gravitation itself might be defined as synonymous with Newtonism (if we may use the term).

Any modern evolution textbook will present this matter in a systematic way.

Evolution, the name for the ages-long gradual development of the wonderful multitude of animal and plant species, is an overly large subject to learn comprehensively. We will not discuss it in this little article, but merely see what fields of evidence there are, what groups of numberless facts in nature have established it, and then this little list of fields of evidence will allow us to differentiate sharply from this other subject of theories of evolution, that is, theories of explanation of the mode of evolution.

There are many fields within the biological sciences that offer overwhelming demonstration for evolution. They comprise: morphology or comparative anatomy, classification, embryology (the prebirth or pre-hatching part of the individual's development), paleontology or the study of fossils, which is the study of the countless relics of the ages of life succession on the globe, geographical distribution of animals and plants, the blood tests, domestication, and some other experimental botanical and zoological lines of research. It would take a series of articles to explain these even very briefly. Everyone who has learned some considerable amount of this evidence realizes that evolution is a fact, or better termed, a natural process or natural law.

But what is the mode of evolution or what the process? How does it go on? By what means is it working? Just what are all the factors deep-seated in nature, and how do they correlate to make all the new species of animals and plants? This is a great problem, not entirely solved. This is obviously a different inquiry from that of the evidences for evolution itself. Evolution is history. The meaning of the phrase *theories of evolution*, is not the history itself but the inherent things that cause and accomplish this particular succession, or cause this history, of new organisms.

To answer or attempt to answer the problem of the mode or method of evolution, or the cause of origin of new species, has been the work of many biologists, and has been worked up together with the accumulation of evidence of the fact of evolution. Underlying these explanations or theories are some absolutely fundamental factors, namely heredity, variation, and selection.

The most important theories that have been promulgated, without reference to their present standing are: Lamarck's theory, sometimes called the theory of use and disuse, which is the oldest scientific theory of evolution worth noting; Darwin's theory, the theory of natural selection or survival of the fittest, which can be called Darwinism correctly; DeVries's theory or mutation theory; the orthogenesis theories; isolation theories, and others, some of which are best in correlation with others.

The important point in this connection is that difference of opinion with respect to any or all these theories has not the slightest effect on evolution itself. All biologists—and everyone worthy of the name is meant here, not some teachers in fundamentalist colleges who may warp their biology to suit their fundamentalist masters—accept evolution, though they may be arguing about Darwinism, DeVries's mutation and Lamarckism.

The public so often confuses the two, evolution, and these theories of evolution. In newspaper articles, particularly in the glaring, ambiguous headlines, they are confused time and time again. Disagreement over some detail of the causal theories of evolution, denial of Darwinism or of Lamarckism, is wrongfully misinterpreted as denial of evolution. It is high time that purveyors of news and opinion and the public at large get this matter carefully in mind.

SHARES AVAILABLE

The Evolution Publishing Corporation, organized under New York State laws, offers its $10.00 shares of 6% preferred stock. With every five shares of preferred one $10.00 share of common, voting stock will be given, if paid by April 13th.

The immediate business is publishing this journal, Evolution and selling books. Later a Lyceum Bureau for touring natural science lecturers will be developed.

Although it is expected the business will pay, share-holders are not invited on the basis of making profits, but because this work is WORTH DOING.

Additional capital furnished now will help make the circulation campaign for Evolution magazine a success. Checks should be made payable to Evolution Publishing Corporation. In remitting kindly state whether payment is made in full, or whether it should be applied on a larger block of stock to be held until balance is paid.

LET US MAIL SAMPLES TO YOUR FRIENDS

Of course you'll show this issue of Evolution to your friends and ask them to subscribe. But you probably know some who would be interested, whom you can not visit yourself. Send us their names and addresses and we'll mail them sample copies.

It will cost us about five cents a copy to send out these samples, so if you can send along a check to help pay for them we'll not object. However, if your bank account is minus don't let that stop you. Send us the names anyway and we'll raise the cash otherwise.

WHAT'S A HUNTER WITHOUT AMMUNITION?

A hunter without ammunition is in the same fix as an evolutionist without copies of Evolution. Surely YOU don't want to remain in such a pickle. The best way out is for you to fill in appropriate characters on the following blank in a hurry.

— — — — — — — — —

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Send me a bundle of ..... copies of Evolution every month for one year. (Rate: five or more, 50c each per year)

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Funnymentals

"I. We believe in the Scriptures of the Old and New Testament as verbally inspired of God, and inerrant in the original writings, and that they are of supreme and final authority in faith and life.

II. We believe in one God, eternally existing in three persons, Father, Son and Holy Spirit.

III. We believe that Jesus Christ was begotten by the Holy Spirit, and born of the Virgin Mary, and is true God and true man.

IV. We believe that man was created in the image of God, that he sinned and thereby incurred not only physical death but also that spiritual death which is separation from God; and that all human beings are born with a sinful nature, and, in the case of those who reach moral responsibility, become sinners in thought, word and deed.

V. We believe that the Lord Jesus Christ died for our sins according to the Scriptures as a representative and substitutionary sacrifice; and that all that believe in Him are justified on the ground of His shed blood.

VI. We believe in the resurrection of the crucified body of our Lord, in His ascension into heaven, and in His present life there for us, as High Priest and Advocate.

VII. We believe in "that blessed hope", the personal, premillennial and imminent return of our Lord and Saviour Jesus Christ.

VIII. We believe that all who receive by faith the Lord Jesus Christ are born again of the Holy Spirit and thereby become children of God.

IX. We believe in the bodily resurrection of the just and the unjust, the everlasting felicity of the saved and the everlasting conscious suffering of the lost."

Confession of Faith of Worlds Christian Fundamentals Association, reprinted from February 1928 number of its official organ.

EVOLUTION VERSUS THEOLOGY

Maynard Shipley, evolutionist, and John Roach Straton, fundamentalist, debated March 7th at the Civic Center Auditorium in San Francisco.

Approximately five thousand people, mostly fundamentalists, attended and fervently applauded their speaker, and boohooed science and evolution.

Upon leaving the auditorium an apparently intelligent person was heard to remark: "I never before believed that man descended from monkey, but since I have seen five thousand people fervently applaud fundamentalism, which has given us nothing, and attempt to boohoo science, which has given us everything, I am thoroughly convinced that man didn't descend from monkey, but that he still is one." *J. Baxter*

NEWS FROM ARKANSAS

Although the Secretary of State in Arkansas writes that no petition has been filed with him as yet, we have definite report that the fundamentalists have already secured enough signatures to their petition to place the question of evolution on the ballot in Arkansas at the next election.

EVOLUTION ON THE AIR

Maynard Shipley, President of the Science League of America, is giving a series of talks on evolution over the radio (Station KFRC, San Francisco) at 4 P. M. Pacific time on alternate Thursday afternoons, March 15th, 29th, etc.

Readers of EVOLUTION having followed Mr. Shipley's splendid articles in this journal will surely be delighted to hear him, and to ask their friends also to listen in. Let Station KFRC know that this is appreciated.

AND NOW KENTUCKY

Representative Hobbs of Wolfe and Powell Counties, Kentucky, has just introduced an anti-evolution bill in the Kentucky General Assembly. This body voted down an anti-evolution bill in 1921 by 42 to 41, and again defeated the proposition in 1926. But since then the Fundamentalist Bible Crusaders, Ku Klux Klan, etc., have been active in Kentucky and the outcome this time is by no means assured.

MY ANCESTORS

At work or play from day to day
I dream of them serenely,
Not just as folks are thought to dream
Of forbears quaint and queenly;
Of Kings and Lords, with crowns and swords,
The artists are but jesters,
But of the sort that science says
Were likely our ancestors.

I watch my wife, with fork and knife
And all her house utensils,
Or at my desk I take account,
Of papers, books, and pencils;
And quick as scat, all this and that
Has vanished quite completely,
And I am some perplexed to tell
The simple truth discreetly.

My wife is there, dressed just in hair
And hide, to put it plainly,
Or rather I should say, my wives;
I try to blush quite vainly,
If that is me I humbly see
Rubbing my nose, and scratching
In the inimitable way
Of monkeys who are matching.

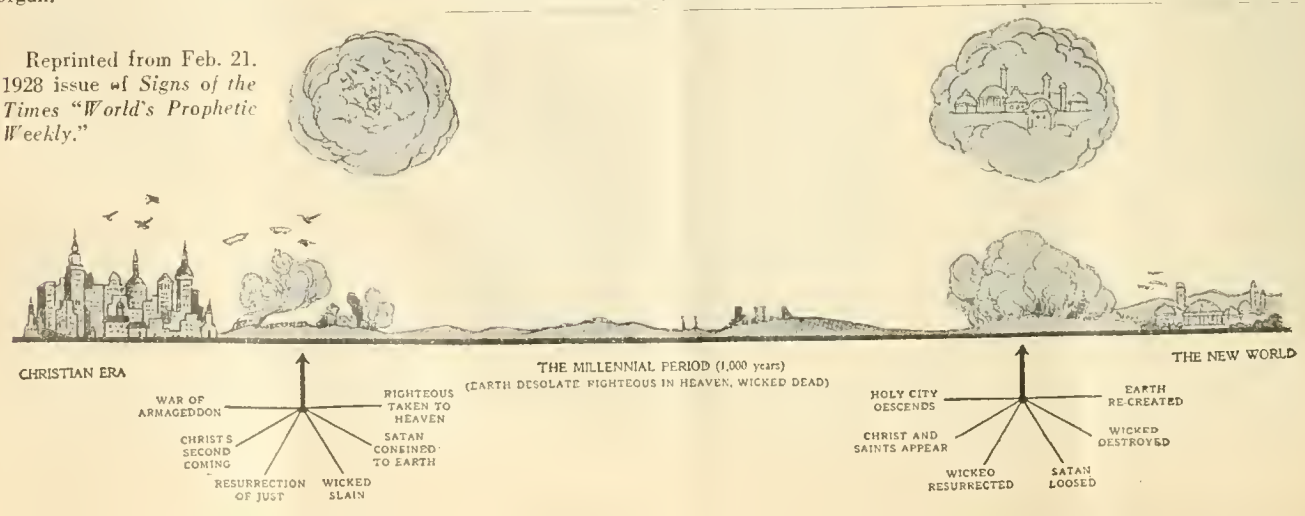
On every hand the monkey band
Are in a merry riot;
They live, these ancestors of mine
Upon a simple diet;
They do not work, they do not shirk,
Nor go to church on Sunday,
And as they have no clothes to soil
They never wash on Monday.

They have no creeds, no title deeds,
Nor lawyers nor physicians;
No flags or governments to breed
A pest of politicians:
They have no cooks, they have no books,
No landlords and no tailors,
No soldiers and no serving-men,
No preachers and no jailors.

My ancestors, and also yours,
However we deny them,
Whether for better or for worse
Our present ways belie them:
I wonder much at such and such,
By decent folks defended,
And sometimes feel too sure that man
Is from the ape *descended*.

—ROBERT WHITAKER

Reprinted from Feb. 21, 1928 issue of *Signs of the Times "World's Prophetic Weekly."*



A Greater Danger Than Evolution

By CLEVELAND SYLVESTER SIMKINS

A FAR greater danger to the established dogmas of religious intoleration than evolution lies in the chemical analysis of the phenomena of life. This field is new and the startling discoveries already made are quite unintelligible to the censoring angels of American morals, education and the Statue of Liberty. Just now the fundamentalists are awakening to the somnambulant delusion that Darwin and Nietzsche are responsible for the doctrine of evolution, sixty-five years after the appearance of the "Origin of Species", and three thousand after the first hint of an evolutionary process, hence it may be reasonable to predict that a hundred years more and we shall be forbidden to experiment upon the living cell because it writes the chemical formula of the soul and proves that life is a physio-chemical process.

This myriad I, composed of units below the range of naked vision, labors to produce my individuality from fertilization to the grave. Even Christ was wrong for the lilies of the field toil and spin, though rooted to the spot. We die, so does the lily of the field, but the chemical substances and physical forces undergo their transformations even after death; perhaps they pause, but rather does it seem as if they rise again to keep the living things upon the earth potentially immortal. Each living cell possesses that capacity of potential immortality, for if isolated, fed and warmed and watered it will live on and on as an independent unit outside the body that nourished and differentiated it. The isolated cell respires, it breathes, responds to stimuli, conducts an electric current with varying intensity according to the condition of its vitality. I may slowly kill the cell and in its lingering death determine that the amount of carbon dioxide given off slowly falls as death o'er takes it, but never falls to zero. The electrical resistance decreases to the point of death, but never does it cease completely. Hence the process of death, of vitality and reactivity presents mechanisms that can be measured and investigated by accurate means. The mechanism of life and death contains no vital principle, no *elan vital*, no spiritual power nor mystic source of energy beyond the ken of man's intelligence or the penetration of his dissecting needle.

Those pioneer investigators who have progressed so far into the seemingly unknowable things of life, have passed beyond the outposts set up by evolution and boldly explore a new and fertile field, half hid from the eyes of the world. We are unprovoked by the searchers for the Holy Grail, because they know not what we do.

Stop us from teaching evolution if you will, that lies behind us, it cannot be eradicated nor beaten from the minds of scholars; naught can avail from its suppression for we shall turn to deadlier weapons still, since they are already in our hands.

OTHER WORLDS, *By O. J. Schuster*, The Christopher Publishing House, Boston, $1.50.

Good popularizations of science always delight me and I have been having a particularly good time reading Schuster's "Other Worlds", there being only one little fly in the ointment. The facts of general astronomy are correctly stated and could hardly be more condensed, yet his way of putting it all is so pleasantly lucid that one gets no impression of condensation. One takes brief, vivid journeys to strategic points on the earth, to the moon, sun and planets and finally a round trip of the high spots of the universe, travelling when necessary with the speed of light. Astronomy has always had a popular appeal, but the author has done so very well that even the long familiar subject becomes freshly marvelous.

There is just the remotest hint in the foreword that the author intends to repeat his performance in other fields of science. I hope so and invite him to. He has the knack and sticks to the facts —which are wonderful enough—so he qualifies fully by my standards.

But I have a complaint when he takes us aboard his "Magic Ship Mintaka". Human beings do not like to be patronized, and this device strikes me as distinctly patronizing. I dare say the trouble is that he really does nothing with it when he has created it. Had he romanced with it like a Jules Verne, I am sure I would have been satisfied. Had he introduced us to its mechanism, taught us to operate it, and had thrilling accidents happen to it, then one could be satisfied. But to go aboard a "magic ship," which he did not even picture, and then not to be permitted to run the darn thing, is quite too much. When I go on his next trip, I hope the old boat sinks. But in spite of it, this was a great trip.

A. S. B.

HONORS FOR FEBRUARY

The honors for the best sale during February again go to R. Walsh of the Little Blue Book Shop, 3441 Woodward Avenue, Detroit, with 200 copies. Who'll beat this for March?

Fuming Fundamentalist (orating): "Do I look as though I descended from a monkey? Do I?"

Back Seat Wag: "You don't, Mister, for a fact. Tell us how it happened!"

SOME GOOD BOOKS

EVERY reader of EVOLUTION is *of course* also a reader of books. We recommend the following in their respective fields.

We shall also be glad to supply any other books at regular pulishers price.

The commission we receive on book sales will help to broadcast EVOLUTION, but we'll share it with you.

In combination with a one year subscription for EVOLUTION at one dollar, you may deduct $1.00 on an order of over $5.00.

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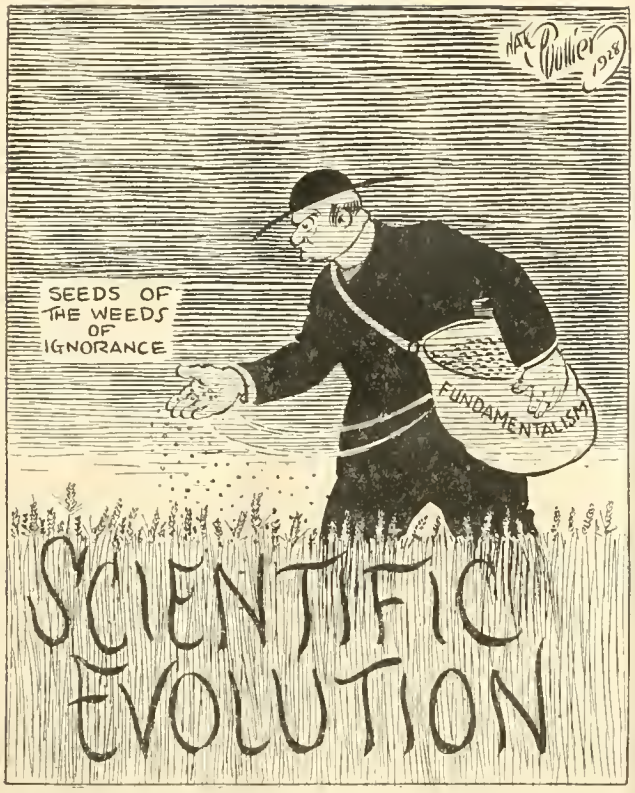

"While men slept his enemy came and sowed Tares among the wheat and went his way".

IN THIS ISSUE:

HARRY ELMER BARNES: Author, "The Genesis of the World War".

ALLAN STRONG BROMS: Formerly Science Lecturer, Twin Cities Workers University Society.

GEORGE A. DORSEY: Author "Why We Behave Like Human Beings" and "The Nature of Man".

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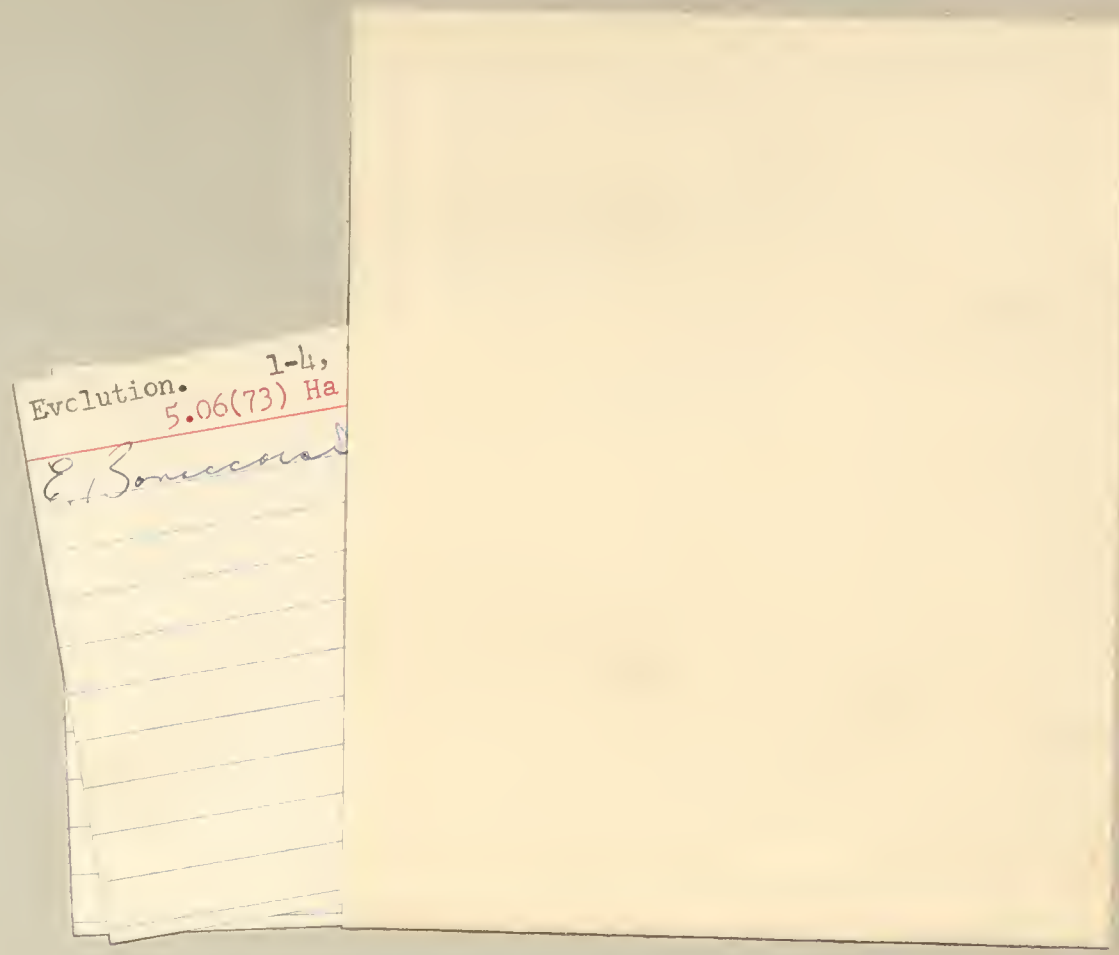

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